(19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 14 July 2005 (14.07.2005)

PCT

(10) International Publication Number WO 2005/062905 A2

(51) International Patent Classification:

Not classified

(21) International Application Number:

PCT/US2004/043201

(22) International Filing Date:

21 December 2004 (21.12.2004)

(25) Filing Language:

£ي. ا.

English

(26) Publication Language:

English

(30) Priority Data:

60/532,839

24 December 2003 (24.12.2003)

- (71) Applicant (for all designated States except US): GEL-CORE LLC [US/US]; 6180 Halle Drive, Valley View, OH 44125-4635 (US).
- (72) Inventors: SHELTON, Bryon, S.; 414 William Street, Bound Brook, NJ 08805 (US). LIBON, Sebastian; 95 Horatio Street, Apt. 617, New York, NY (US). ELIASHE-VICH, Ivan; 514 Prospect Street, Maplewood, NJ 07040 (US).
- (74) Agent: MCCOLLISTER, Scott, A.; Fay, Sharpe, Fagan, Minnich & McKee, LLP, 1100 Superior Avenue, Seventh Floor, Cleveland, OH 44114-2579 (US).

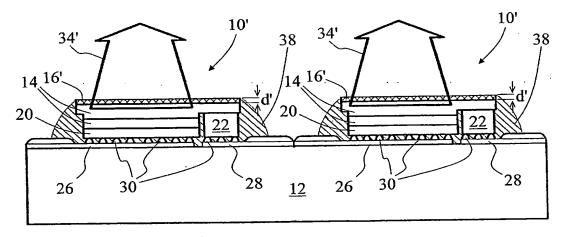
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GO, GW, ML, MR, NE, SN, TD, TG).

Published:

without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: LASER LIFT-OFF OF SAPPHIRE FROM A NITRIDE FLIP-CHIP



(57) Abstract: In a method for fabricating a flip-chip light emitting diode device, epitaxial layers are deposited on a sapphire growth substrate to produce an epitaxial wafer. A plurality of light emitting diode devices are fabricated on the epitaxial wafer. The epitaxial wafer is diced to generate a device die. The device die is flip chip bonded to a mount. The flip chip bonding includes securing the device die to the mount by bonding at least one electrode of the device die to at least one bonding pad of the mount. Subsequent to the flip chip bonding, the growth substrate of the device die is removed via the application of laser light.